Mars Surveyor 98 Project

Mars Polar Lander
Surface Stereo Imager
Experiment Data Record
Compact Disc - Read Only Memory
Software Interface Specification

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Elizabeth Duxbury

DRAFT

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Concurrence on Version 1.0 of Mars Surveyor 98 SSI EDR CD-ROM Specification

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ACRONYMS AND ABBREVIATIONS

ASCII	American Standard Code for Information Interchange
CCD	Charge-Coupled Device
CD-ROM	Compact Disc - Read Only Memory
CD-WO	Compact Disc - Write Once
CODMAC	Committee On Data Management And Computation
CR	Carriage Return
DN	Data Number or Digital Number
DOS	Disc Operating System
DPW	Data Preparation Workbook
EDR	Experiment Data Record
GIF	Graphics Interchange Format
HFS	Hierarchical File System
HTML	HyperText Markup Language
IBM	International Business Machines®
ISO	International Standards Organization
JPEG	Joint Photographic Experts Group
JPL	Jet Propulsion Laboratory
LF	Line Feed
M98	Mars Surveyor 98
Mbytes	Megabytes
MCO	Mars Climate Orbiter
MIPL	Multimission Image Processing Laboratory
MIPS	Multimission Image Processing Subsystem
MPL	Mars Polar Lander
MSP	Mars Surveyor Program
MVACS	Mars Volatiles and Climate Surveyor
NAIF	Navigation and Ancillary Information Facility
NASA	National Aeronautics and Space Administration
NSSDC	National Space Science Data Center
PC	Personal Computer
PDF	Adobe® Portable Document Format
PDS	Planetary Data System
PDS-CN	PDS Central Node
PSDD	Planetary Science Data Dictionary
RAC	Robotic Arm Camera
SCLK	Spacecraft Clock Count (usually implies *start* count)
SIS	Software Interface Specification
SSI	Surface Stereo Imager
TBD	To Be Determined
TIFF	Tag Image File Format
VICAR	Video Image Communication and Retrieval system
VMS	Virtual Memory System
XAR	Extended Attribute Record

ACTION ITEMS FOR CLOSURE

Item	Sec.	Assignee	Closure Date
Get JPL D# and project number, if applicable	front head	E. Duxbury	
Update relevant documents list	1.3	E. Duxbury	
Check estimated number of volumes	2.2	E. Duxbury	
Determine what calibration data will be included on CD	3.2.2.2	MVACS Team	
Determine what additional documents will be included on the CD.	3.2.2.4	MVACS Team	
Determine what display software can/should be included on the CD.	3.2.2.7	E. Duxbury, S. Hughes, D. Jensen	

1.0   INTRODUCTION

1.1   Content Overview

This Software Interface Specification (SIS) describes the form and content of the Surface Stereo Imager (SSI) Experiment Data Record (EDR) Compact Disc - Read Only Memory (CD-ROM).

The SSI EDR CD-ROMs shall be generated by the Multi-mission Image Processing Subsystem (MIPS) at the Jet Propulsion Laboratory in order to distribute the data acquired by the SSI to the project scientists and later to the Planetary Data System (PDS).

A detached PDS label shall be included with each data file. Documentation files shall be provided which inform the user about the organization and content of each disc, the definition of the labels, and the index files containing information about all the data files stored in the data set.

All PDS label formats and documentation are based on the Planetary Data System Data Preparation Workbook (reference 1).

All data formats are based on the Planetary Science Data Dictionary Document (PSDD) (reference 3).

1.2   Scope

The specifications in this document apply to all SSI EDR CD-ROMs that are produced during the Mars Surveyor 98 mission.

1.3   Applicable Documents

Applicable documents used in producing this specification include:

1) Planetary Data System Data Preparation Workbook, JPL D-7669, Part 1.
2) Planetary Data System Standards Reference, JPL D-7669, Part 2.
3) Planetary Science Data Dictionary Document, JPL D-7116.
4) Information Processing - Volume and File Structure of CD-ROM for Information Interchange, ISO 9660-1988.
5) Mars Volatiles and Climate Surveyor Experiment Data Record, JPL D-?.
6) MSP 98 (Mars Climate Orbiter and Polar Lander): Archive Generation, Validation, and Transfer Plan, ?
7) Mars Surveyor Program Data Management Plan, ???

2.0 INTERFACE CHARACTERISTICS

2.1 Operations Perspective

2.1.1 Data Source, Destinations, and Transfer Method

SSI EDR CD-ROMs shall be produced by MIPS for distribution to the Mars Surveyor 98 Project. MIPS shall use freely available CD-ROM publishing software, which shall reside at MIPS, to produce premastered CD-WOs for delivery and release to the mastering vendor for production of CD-ROMs. The mastering vendor will ship the discs to MIPS for distribution and archiving. Copies of the CDs will be archived with the Imaging Node of the PDS and with the National Space Science Data Center.

2.1.2 Generation Method and Frequency

The SSI EDR CD-ROM data shall be generated using MIPS software. The EDR data processing includes decoding and decompressing the SSI image data in single frame form. These data products conform to NASA level 0 or CODMAC level 2 data products. (A more complete description of the EDRs is available in the MVACS EDR SIS, reference 5, a copy of which will be included on the CDs.) MIPS will then pre-master the data to CD-WO.

The CD-ROMs shall be produced as rapidly as possible on a best efforts basis. It is intended that the first CD volume should be published within six months of receipt of the data.

2.2 Volume and Size

Each CD-ROM shall contain at most 650 Mbytes of data. Within this limitation, as many data files as can fit on a CD-ROM will be included. This is expected to result in the publication of an approximately four volume set.

2.3 Interface Medium Characteristics

SSI EDR CD-ROM physical characteristics shall conform to ISO-9660 level 2 industry standards (reference 4).

2.4 Backup and Duplicate Copies

The CD-ROM contents shall be stored on magnetic disc until a validated master has been produced. CD-WO copies of the disc shall be retained at MIPS.

3.0 CD-ROM CONTENT AND FORMAT

This section describes in detail the format and content of the SSI EDR CD-ROM.

3.1 Format

SSI EDR CD-ROM data shall be formatted in accordance with Planetary Data System specifications (references 1-3). The format is described below.

3.1.1 Disc Format

The SSI EDR CD-ROM format shall be compatible with various computer systems including IBM PC, Apple Macintosh, Sun, and Digital VAX. However, the data files will not contain extended attribute records, so users of older VMS systems may have dificulty reading them. The EDR CD-ROM format shall be in accordance with the ISO-9660 level 2 Interchange Standard (reference 4).

3.1.2 File Formats

The following paragraphs describe file formats for the various kinds of files contained on the CD-ROMs.

3.1.2.1 Text Files

Text files (.TXT suffix) may exist in any directory, including the root directory. They are ASCII files with attached PDS labels, and provide information about the data on the CD (as in the AAREADME.TXT file) or about data in a specific directory. All text files are streams of bytes with both a carriage return character (ASCII 13) and a line feed character (ASCII 10) as the line terminator. This allows the files to be read by the HFS, DOS, UNIX, and VMS operating systems.

The following is a sample PDS label for an AAREADME.TXT file.

```
PDS_VERSION_ID          = PDS3
RECORD_TYPE             = STREAM

OBJECT                  = TEXT
  PUBLICATION_DATE      = 1997-07-04
  INTERCHANGE_FORMAT    = ASCII
  NOTE                  = "This file describes the format and content of
                          this CD-ROM."
END_OBJECT              = TEXT
END
```

3.1.2.2 Document Files

Document files exist in the document directory, and include textual material describing the mission, spacecraft, instruments, data sets, and calibration. Additional document files may be found in the browse directory of the CD. Possible formats for these documents include Adobe Portable Document Format (".PDF"), HyperText Markup Language (".HTM"), and plain ASCII (".ASC"). At least one copy of each document file must be in either plain ASCII or HTML. Illustrations and images for these documents are stored in separate GIF, TIFF, or JPEG formatted files, which are also considered to be document files.

All ASCII and HTML files are streams of bytes with both a carriage return character (ASCII 13) and a line feed character (ASCII 10) as the line terminator. The ASCII files can be read on any

operating system. The HTML files can be read with most World Wide Web browsers that are
capable of displaying tables. The PDF documents are a binary format that can be read with the
Adobe Acrobat Reader, available from "http://www.adobe.com". GIF, TIFF, and JPEG images
can be displayed using many commonly available image display programs.

All document files are described by detached PDS labels. The PDS label file has the same name
as the document file(s) it describes, with the extension ".LBL", unless the single label describes
multiple files that make up the same document, (ex., "CALIB001.GIF", "CALIB002.GIF",
"CALIB003.GIF"). In this case, the label file has a similar name to the document, ex. "CALIB.LBL".
The following is a sample detached PDS label file, entitled "VOLSIS.LBL", describing this
document, found in the "VOLSIS.HTM" and "VOLSIS.PDF" files.

```
PDS_VERSION_ID          = PDS3
RECORD_TYPE             = STREAM
^HTML_DOCUMENT          = "VOLSIS.HTM"
^PDF_DOCUMENT           = "VOLSIS.PDF"

OBJECT                  = HTML_DOCUMENT
  DOCUMENT_NAME         = "Mars Surveyor 98 SSI EDR CD-ROM SIS"
  DOCUMENT_TOPIC_TYPE   = VOLUME_SIS
  INTERCHANGE_FORMAT    = ASCII
  DOCUMENT_FORMAT       = HTML
  PUBLICATION_DATE      = 1999-06-01
END_OBJECT              = HTML_DOCUMENT

OBJECT                  = PDF_DOCUMENT
  DOCUMENT_NAME         = "Mars Surveyor 98 SSI EDR CD-ROM SIS"
  DOCUMENT_TOPIC_TYPE   = VOLUME_SIS
  INTERCHANGE_FORMAT    = BINARY
  DOCUMENT_FORMAT       = PDF
  PUBLICATION_DATE      = 1999-06-01
END_OBJECT              = PDF_DOCUMENT
END
```

3.1.2.3 Catalog Files

Catalog files (".CAT" suffix) exist in the catalog directory, with the exception of the
VOLDESC.CAT file which is located in the root directory. These are ASCII files formatted as PDS
catalog objects (see reference 2). All catalog files are streams of bytes with both a carriage return
character and a line feed character as the line terminator. This allows the files to be read by the
HFS, DOS, UNIX, and VMS operating systems.

Copies of some catalog files are also included in HTML format. These files are indicated with the
suffix ".HTM" and are kept in the document, rather than the catalog, directory.

3.1.2.4 Tabular Files

Tabular files (.TAB suffix) are ASCII files formatted for direct reading into many database
management systems on various computers. All fields are separated by commas, and character
fields are enclosed in double quotation marks ("). (Character fields are padded with spaces to
keep quotation marks in the same columns.) Character fields are left justified, and numeric fields
are right justified. The "START_BYTE" and "BYTES" values listed in the labels do not include the
commas between fields or the quotation marks surrounding character fields. The records are of
fixed length, and the last two bytes of each record contain the ASCII carriage return and line feed
characters. This allows a table to be treated as a fixed length record file on computers that
support this file type and as a normal text file on other computers.

All tabular files are described by detached PDS labels. The PDS label file has the same name as the data file it describes, with the extension .LBL; for example, the file INDEX.TAB is accompanied by the detached label file INDEX.LBL in the same directory.

3.1.2.5   PDS Label Files

PDS label files (.LBL suffix) are located in many directories. They are descriptive labels (see reference 4) and may be either attached to or detached from their associated files.

The PDS label file is an object-oriented file; the object to which the label refers (e.g. IMAGE, TABLE, etc.) is denoted by a statement of the form:

```
^object = location
```

in which the carat character (^, also called a pointer in this context) indicates that the object starts at the given location. The location denotes the name of the file containing the object, if the label is detached, or the starting record or byte number, if the label is attached. For example:

```
^INDEX_TABLE = "INDEX.TAB"
```

indicates that the INDEX_TABLE object described by the INDEX.LBL file is in the file named "INDEX.TAB".

```
^IMAGE = 3
```

indicates that the IMAGE object begins at record 3 of the same file that the label is attached to. Below is a list of the possible formats for the ^object definition.

```
^object       = n
^object       = n <BYTES>
^object       = ("filename.ext")
^object       = ("filename.ext", n)
^object       = ("filename.ext", n <BYTES>)
^object       = ("dirlist/filename.ext", n <BYTES>)
```

where

n	is the starting record or byte number of the object, counting from the beginning of the file (unless specified as bytes, this is assumed to be records),
<BYTES>	indicates that the number given is in units of bytes,
filename	is the upper-case file name,
ext	is the upper-case file extension,
dirlist	is a UNIX style, forward slash-delimited path-list of parent directories, in upper case, that specifies the object file directory (used only when the object is not in the same directory as the label file). The list begins at directory level below the root directory of the CD-ROM. 'dirlist/' may be omitted when the object being described is located either in the same directory as the detached label, or in a subdirectory named 'label' that is located in a higher level of the directory tree, typically the CD-ROM root itself.

The internal format of the data object is then described within the PDS label in an area constructed as follows:

```
OBJECT       = object
  KEYWORD1     = value1
```

```
  KEYWORD2      = value2
  .
  .
  .
  KEYWORDn      = valuen
END_OBJECT      =
```

Brief descriptions of the IMAGE, TABLE, and COLUMN objects are given here as these objects
are commonly used on this CD volume. (The INDEX_TABLE object is a sub-type of the TABLE
object and is constructed similarly.) Complete details and descriptions of other data objects are
available in the PDS Standards Reference (ref. 2).

The following is an example of a typical IMAGE object for a data file on this CD volume:

```
OBJECT                      = IMAGE
  INTERCHANGE_FORMAT        = BINARY
  LINES                     = 248
  LINE_SAMPLES              = 256
  BANDS                     = 1
  SAMPLE_TYPE               = MSB_UNSIGNED_INTEGER
  SAMPLE_BITS               = 16
  SAMPLE_BIT_MASK           = 2#0000111111111111#
  MAXIMUM                   = 3296
  MEAN                      = 570.6900
  MEDIAN                    = 512
  MINIMUM                   = 77
  STANDARD_DEVIATION        = 356.8550
  FIRST_LINE                = 3
  FIRST_LINE_SAMPLE         = 1
  CHECKSUM                  = 8204396
END_OBJECT                  = IMAGE
```

The image data, as pointed to by the ^IMAGE pointer, are completely described by this object.
The INTERCHANGE_FORMAT keyword indicates that the data described by this object is in a
binary form. The LINES and LINE_SAMPLES keywords give the number of pixels (picture
elements) in the vertical and horizontal directions, respectively. The SAMPLE_BITS keyword
provides the number of bits per pixel. The SAMPLE_BIT_MASK keyword shows which of the
bits in a pixel are actively used. (Thus, the above data is actually 12-bit data, even though the
pixels are stored as 2-byte values.) The BANDS keyword provides the number of planes of data.
The rest of the keywords provide statistical information about the image data, or indicate its
offset within the CCD frame.
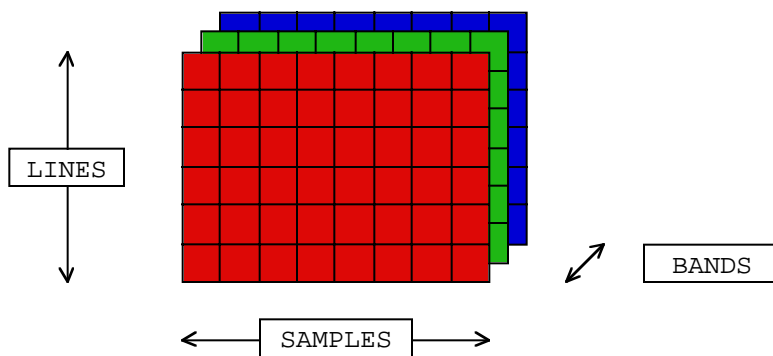
The second example of an object is somewhat more complex, since it involves one object stored within another. The following objects describe the structure of a simple table with 3 columns and 4 rows.

<--------Column 1-------->							Column 2			<----Column 3---->					
"	L	E	M	O	N	"	,	1	1	9	,	Y	E	L	L	O	W	<CR>	<LF>
"	A	P	P	L	E	"	,		8	7	,	R	E	D				<CR>	<LF>
"	G	R	A	P	E	"	,			2	,	G	R	E	E	N		<CR>	<LF>
"	O	R	A	N	G	E	"	,	3	1	4	,	O	R	A	N	G	E	<CR>	<LF>
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1

```
OBJECT                          = TABLE
   INTERCHANGE_FORMAT           = ASCII
   ROWS                         = 4
   COLUMNS                      = 3
   ROW_BYTES                    = 21

   OBJECT                       = COLUMN
      NAME                      = FRUIT
      DATA_TYPE                 = CHARACTER
      START_BYTE                = 2
      BYTES                     = 6
   END_OBJECT                   = COLUMN

   OBJECT                       = COLUMN
      NAME                      = NUMBER
      DATA_TYPE                 = ASCII_INTEGER
      START_BYTE                = 10
      BYTES                     = 3
   END_OBJECT                   = COLUMN

   OBJECT                       = COLUMN
      NAME                      = COLOR
      DATA_TYPE                 = CHARACTER
      START_BYTE                = 14
      BYTES                     = 6
   END_OBJECT                   = COLUMN
END_OBJECT                      = TABLE
```

As in the IMAGE object, the INTERCHANGE_FORMAT provides the internal format of the data, in this case ASCII. The ROWS and COLUMNS keywords provide the number of rows and columns. The columns are delimited by commas, and the rows by the carriage return (ASCII 13) and line feed (ASCII 10) characters. The ROW_BYTES keywords provides the total number of bytes used to store each row of table data, including the column delimiters and line termination characters.

Within the TABLE object is a second object, the COLUMN object. These objects describe the format of the individual fields in the table. The NAME keyword is used to distinguish one column object from another. The DATA_TYPE keyword provides the format of the data within that field. The START_BYTE keyword provides the starting byte, within each row, of the data part of the field. Note that this does not include field delimiters or quotation marks used to enclose character values. (For example, the "FRUIT" column in the above example starts in the second, not the first byte position. Finally, the BYTES keyword indicates the length of the field in bytes, again excluding delimiters and quotation marks.

Additional keywords may be used in both of these objects to provide supplementary information.

All PDS labels contain a carriage return character (ASCII 13) and a line feed character (ASCII 10) as the line termination characters. This allows the files to be read by the HFS, DOS, Unix, and VMS operating systems.

3.1.2.6 Data Files

The detailed specifications for the formats of the image files are described in a Software Interface Specification published by MIPS (reference 5) and in the DATASET.CAT file, both of which are included on the CDs. All of the image files with the exception of the summation files are uncompressed 16-bit PDS formatted files with detached PDS labels. The summation files may be 32-bit PDS formatted files.

3.2   Content

The following paragraphs describe the content of the CD-ROMs.

3.2.1   Volume Set

The SSI EDR CD-ROM volume set is numbered M98SSI_0001 through M98SSI_000x. Each CD in the set will contain the same directory structure, with the exception of the data subdirectories, which will vary from one CD to another, as they are named on the basis of spacecraft clock count (ie., time).

3.2.2   Directories

The SSI EDR CD-ROM directory structure consists of one ROOT directory, a BROWSE subdirectory, a CALIB subdirectory, a CATALOG subdirectory, a DOCUMENT subdirectory, a GAZETTER subdirectory, an INDEX subdirectory, and multiple data subdirectories. The data subdirectories are divided up on the basis of spacecraft clock count.

The root directory contains files describing the content and format of the CD-ROMs. The calibration subdirectory contains information about the calibration of the SSI EDR images. The catalog subdirectory contains the completed catalog object templates describing the mission, instruments, etc. The document directory contains duplicates of the files in the catalog directory, formatted for easier reading by humans. It also contains additional, supplemental documentation that will help in understanding the SSI EDR data set. The gazetteer directory includes a gazetteer of the informal names of the rocks and other features at the MPL landing site, in tabular format. Files in the index directory include tables of values describing the observation of each EDR frame.   Files in each of the data subdirectories consist of an EDR data file with an associated detached PDS label, organized in sub-directories by SCLK. The browse subdirectory contains "browse" versions of the data files, formatted for quick display and browsing of the data.

The following tables describe the content and source of files in the CD-ROM directories. (Source indicates the group providing the current version of a file.)

3.2.2.1 Root Directory

The following table lists the files in the root directory. The ERRATA.TXT file may not be present on all CDs, as it will document errors discovered on previous CDs in the set.

Table 3.2.2.1   Root Directory Contents

File	Contents	Source
AAREADME.HTM, LBL, TXT	Textual information describing CD-ROM content and format.	MIPS
ERRATA.HTM, LBL, TXT	Textual information describing errors and/or anomalies found on the current or previous CDs.	MIPS / MVACS Team
VOLDESC.CAT	A description of the contents of this CD-ROM volume in a human and machine readable format.	MIPS

3.2.2.2   Calibration Subdirectory

This directory contains calibration files necessary to calibrate the SSI EDR images on the CD volumes. Included with this is textual information describing the calibration process and how the calibration files were derived. The following table lists the files in the calibration subdirectory. Please note that only those files which are available at the time the data is ready for CD mastering will be included. No guarantee is made that this directory will even be present on the CD volumes.

Table 3.2.2.2   Calibration Directory Contents

File	Contents	Source
CALINFO.TXT	A textual description of the contents of the CALIB subdirectory.	MIPS
	calibration files	MVACS Team

3.2.2.3   Catalog Subdirectory

The files in this directory contain textual information about many aspects of the mission and data, and are written in a format that may be loaded into the PDS Central Node's Data Set Catalog. The following table lists the files in the catalog subdirectory.

Table 3.2.2.3   Catalog Directory Contents

File	Contents	Source
CATINFO.TXT	A textual description of the contents of the CATALOG subdirectory.	MIPS
DATASET.CAT	A description of the SSI EDR data set, including such things as processing history, data format, and ancillary data necessary to use the data.	MIPS / MVACS Team
INST.CAT	A detailed textual description of the Surface Stereo Imager.	MVACS Team
INSTHOST.CAT	A textual description providing an overview of the Mars Polar Lander.	M98 Project
MISSION.CAT	A detailed description of the Mars Surveyor 98 mission.	M98 Project
PERSON.CAT	Contact information for people responsible for producing the data set.	MVACS Team
REF.CAT	A list of references of papers providing further information about the data set.	MVACS Team

3.2.2.4 Document Subdirectory

This directory contains textual files describing the data sets and instruments, plus any other supplementary information available at the time the CDs are ready to be published.

Table 3.2.2.4 Document Directory Contents

File	Contents	Source
DOCINFO.TXT	Textual description of the files included in the document directory.	MIPS
CONTACTS.ASC, LBL	Contact information for Mars Surveyor 98 personnel.	M98 Project
DATASET.HTM, LBL	A description of the SSI EDR data set, including such things as processing history, data format, and ancillary data necessary to use the data.	MVACS Team
EDRSIS.HTM, LBL, PDF	Mars Volatiles and Climate Surveyor Experiment Data Record SIS	MIPS
INST.HTM, LBL	A detailed textual description of the Surface Stereo Imager.	MVACS Team
INSTHOST.HTM, LBL	A textual description providing an overview of the Mars Polar Lander	M98 Project
KEYWORDS.HTM, LBL	A listing of the PDS keywords used in this data set and their descriptions.	MIPS
MISSION.HTM, LBL	A detailed description of the Mars Surveyor 98 mission.	M98 Project
REF.HTM, LBL	A list of references of papers providing further information about the data set.	MVACS Team
VOLSIS.HTM, LBL, PDF	MPL Surface Stereo Imager Experiment Data Record CD-ROM SIS	MIPS
?	Other documentation necessary for understanding the data set.	MVACS Team

3.2.2.5 Gazetteer Subdirectory

The files in this directory contain textual and tabular information about the named features at the Mars Polar Lander landing site. Please note that this information is provided as a convenience to researchers, and that the names assigned to features here have not been approved by the International Astronomical Union. Also note, that only those files which are available at the time the data is ready for CD mastering will be included. Thus, no guarantee is made that all the described files will be included, or that this directory will even be present on the CD volumes.

Table 3.2.2.5 Gazetteer Directory Contents

File	Contents	Source
GAZINFO.TXT	A textual description of the contents of the GAZETTER subdirectory.	MIPS
GAZETTER.TXT	A textual description of the structure and contents of the gazetteer table.	M98 Project
GAZETTER.LBL	The PDS label describing the structure of the gazetteer table.	M98 Project
GAZETTER.TAB	A table of the MPL landing site named features, along with some descriptive information.	M98 Project

3.2.2.6   Index Subdirectory

The following table lists the files in the index subdirectory. The "INDEX" tables on each CD-ROM shall only reflect those files contained on that CD-ROM. Separate, cumulative index files ("CUMINDEX") which contain a complete listing of all EDRs on the set, will also be included on the volumes.

Table 3.2.2.6   Index Directory Contents

File	Contents	Source
INDXINFO.TXT	Textual description of the contents of the INDEX directory.	MIPS
INDEX.LBL	A PDS formatted label describing the format of the INDEX.TAB file.	MIPS
INDEX.TAB	A tabular index of selected label items describing the SSI image files on the CD. This table alone is sufficient for doing simple searches for data on the CDs.	MIPS
CUMINDEX.LBL	A PDS formatted label describing the format of the CUMINDEX.TAB file.	MIPS
CUMINDEX.TAB	A cumulative tabular index containing the contents of the INDEX.TAB files from all of the IMP EDR CD-ROMs.	MIPS
CAM_MOD.LBL	A PDS formatted label describing the format of the CAM_MOD.TAB file.	MIPS
CAM_MOD.TAB	A table containing information about the camera models used to calibrate the SSI EDRs.	MIPS
COMMAND.LBL	A PDS formatted label describing the format of the COMMAND.TAB file.	MIPS
COMMAND.TAB	A table containing information about the commands sent to the SSI camera. Along with the EDRINDEX table, forms a relational database describing most of the available parameters for the images on the CDs.	MIPS
EDRINDEX.LBL	A PDS formatted label describing the format of the EDRINDEX.TAB file.	MIPS
EDRINDEX.TAB	A detailed tabular index of parameters describing the SSI image files. Along with the COMMAND table, forms a relational database describing most of the available parameters for the images on the CDs.	MIPS
GEOMETRY.LBL	A PDS formatted label describing the format of the GEOMETRY.TAB file.	MIPS
GEOMETRY.TAB	A table containing geometry information about each image derived from different models. (If multiple geometries are not derived during the mission, this table may be combined with the EDRINDEX table.)	MIPS

3.2.2.7   Software Subdirectory

This directory will contain image display software capable of displaying the PDS formatted images on this CD. The inclusion of any software depends both on the availability of the software and on the ability to obtain legal permission to distribute it freely. Thus, no guarantee is

made that this directory will be included. It is likely that only one of the following software packages will be included. In any case, only limited platform support is expected.

Table 3.2.2.7 Software Directory Contents

File	Contents	Source
SOFTINFO.TXT	A textual description of the contents of the SOFTWARE subdirectory.	MIPS / PDS-CN
BIN/XVD	Executable VICAR XVD display utility, capable of displaying both VICAR and PDS formatted images. Written in Java.	MIPS
DOC/XVD	Documentation about VICAR XVD software.	MIPS
or		
BIN/RT_DISPLAY	Executable real-time display program, capable of displaying both VICAR and PDS formatted M98 images. Written in Java.	MIPS
DOC/RT_DISPLAY	Documentation about real-time display software.	MIPS
or		
PCWIN/NASAVIEW (various files)	PDS NASAView source, executable, documentation, and sample data for PC Windows 32 platform. Capable of displaying PDS formatted files.	PDS-CN
MAC/NASAVIEW (various files)	PDS NASAView source, executable, documentation, and sample data for Power Macintosh platform. Capable of displaying PDS formatted files.	PDS-CN
SUNOS/NASAVIEW or SUNSOLAR/NASAVIEW (various files)	PDS NASAView source, executable, documentation, and sample data for either the SunOS or the SunSolaris operating system. Capable of displaying PDS formatted files.	PDS-CN

3.2.2.8 Data Subdirectories

The data subdirectories that contain the image EDRs are subdivided on the basis of spacecraft clock start count. The directory names will consist of a "C" (to indicate that the following number is a clock count), followed by the five most significant digits of the SCLK, followed by "XX" (to indicate a range of numbers). Thus, a sample pathname might appear as follows:

```
C12459XX/S1245987653_0055020014L.IMG
```

The contents of the data subdirectories are image files with detached PDS labels, as shown in the following table.

Table 3.2.2.8.A   Data Directory Contents

File	Contents	Source
S<SCLK>_<OBSID>F.IMG (e.g. S1245987653_0055020014L.IMG)	VICAR formatted Experiment Data Record. (Complete format descriptions provided in reference 5 and DATASET.CAT.)	MIPS / MVACS team
S<SCLK>_<OBSID>F.LBL (e.g. S1245987653_0055020014L.LBL)	Detached PDS label describing the VICAR image file. (Complete listing of keyword definitions is shown in ref. 5.)	MIPS / MVACS team

The names for the individual images will consist of a single character instrument identifier, a ten-digit spacecraft clock count, an underscore "_", a ten-digit observation id, a single character frame identifier, a dot ".", and finally a three character file extension. The filenames will be of the form S<SCLK>_<OBSID>F.EXT, where:

Table 3.2.2.8.B   SSI EDR Filename Components

		Possible Values	Meaning
S	instrument identifier	S	Surface Stereo Imager
SCLK	clock count	(any ten digit integer)	ten digits of Spacecraft Clock Start count
OBSID	observation id	(any ten digit integer)	ten digits of Observation ID
F	frame identifer	L	left image
		N	null strip
		P	post strip
		R	right image
		S	dark strip
EXT	file extension	IMG	VICAR formatted image
		LBL	PDS detached label

The image filenames should be unique within this data set; however, it is always best to use the product id when looking for a unique image identifier.

3.2.2.9   Browse Subdirectory

The browse directory contains HTML, GIF, and JPEG files designed to allow for the easy perusal of the data on the CD. This HTML "browser" begins at the top level with the INDEX.HTM file in the BROWSE directory. Beneath this, the browse directory contains a directory structure identical to that of the data subdirectories. Each of these browse subdirectories contains JPEG-formatted thumbnail-sized and GIF-formatted full-sized versions of the images in the equivalent data directory. They also contain HTML files describing both the individual images, and whole directories. The GIF and JPEG files, and the HTML files describing individual images, all have identical names to the images they describe, except that the file extensions have been changed to ".GIF", ".JPG", and ".HTM" respectively. PDS labels with ".LBL" extensions are also present, describing the other files in each directory.

Table 3.2.2.9   Browse Directory Contents

File	Contents	Source
BRWSINFO.TXT	A textual description of the contents of the BROWSE subdirectory.	MIPS
BROWSER.LBL	The PDS label describing the documents in the BROWSE directory.	MIPS
HELP.HTM	An HTML formatted file providing instructions on how to use the browser.	MIPS
INDEX.HTM	An HTML formatted file providing the entry point into the browser.	MIPS
ICONS/*	A subdirectory containing a few GIF formatted icons used in the browser, along with a PDS label describing them.	MIPS
C12345XX/*	Subdirectories containing the HTML formatted browser files, GIF and JPEG formatted browse images, and PDS labels.	MIPS